

**2012 DRAFT
COMPATIBILITY DETERMINATION
FOR
MOSQUITO SURVEILLANCE AND CONTROL
ON
LONG ISLAND NATIONAL WILDLIFE REFUGE LANDS**

Use: Mosquito Surveillance/Control

Refuge Name: Wertheim National Wildlife Refuge (established 1947)
Seatuck National Wildlife Refuge (established 1968)

Establishing and Acquisition Authorities:

Authorized through an Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes. The establishing and acquisition authorities are:

1. 16 U.S.C. 667b, Public Law 80-537, An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other Purposes; and,
2. 16 U.S.C. 715-715R, The Migratory Bird Conservation Act, as amended.

Refuge Purpose(s):

1. "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act).
2. "...particular value in carrying out the national migratory bird management program." 16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes).

National Wildlife Refuge System Mission:

The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats in the United States for the benefit of present and future generations of Americans. (National Wildlife Refuge System Improvement Act of 1997, Public Law 105-57)

Description of Use:

A. What is the Use? Is the use a priority use?

The use is mosquito management which includes surveillance monitoring and, if warranted, control. Mosquito surveillance and control are not a priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

Vector Control is the Suffolk County agency (SCVC) tasked with the management or control of mosquitoes in salt marshes. The Service is working with SCVC to manage mosquito populations while striving to minimize chemical control measures and the associated impacts to fish and wildlife resources. One way to achieve this is by source reduction through Integrated Marsh Management (IMM) which incorporates modified Open Marsh Water Management (OMWM) techniques (Rochlin et al. 2012). This technique manipulates the water flow within marshes, specifically in areas identified as containing high densities of mosquito larvae, allowing predatory fish access to these areas. This reduces the need for other control methods such as pesticides and can result in long-term mosquito control.

Although mosquito surveillance and/or control by the application of larvicides, adulticides, or by source reduction methods (within the tidal saltmarshes of the Wertheim and Seatuck NWR) are not priority public uses of the National Wildlife System, the Service's Interim Mosquito Guidance (2005) does allow for it under certain conditions. This document states that "when necessary to protect human, wildlife, or domestic animal health, the Service will reduce mosquitoes associated health threats using an integrated pest management (IPM) approach, including when practical compatible, non-pesticide actions that reduce mosquito production. Except in officially determined health emergencies, any procedure the Service uses to reduce mosquito production will meet compatibility requirements as found in 603 FW 2 and must give full consideration to the safety and integrity of non-target organisms and communities, including federally listed threatened and endangered species." Essentially, the US Fish and Wildlife Service has a responsibility to protect the surrounding community from serious health threats that find their source on refuge lands.

B. Where would the use be conducted?

Mosquito surveillance/control activities would be conducted within approximately 450 acres of saltmarsh and open water areas at Wertheim NWR (Shirley, NY) and approximately 67 acres of saltmarsh and open water areas at the Seatuck NWR (Islip, NY). If approved by the Refuge Manager, SCVC would aerially apply larvicides in designated breeding areas of the marshes at Wertheim NWR and Seatuck NWR or conduct control through source reduction methods such as Integrated Marsh Management (IMM).

C. When would the use be conducted?

Surveillance activities associated with this use would be conducted from May through September on a weekly basis under the conditions of this Compatibility Determination and a Special Use Permit. Any mosquito control activities would be conducted on the basis of surveillance data. Treatment of Refuge marshes using larvicides by SCVC would occur only after Refuge personnel have reviewed data collected by SCVC and concur that mosquito larva populations are widespread within a marsh unit and in numbers exceeding 0.2 larvae per dip, a level found to result in an increased risk of disease transmission. Other factors used to determine whether treatment would be

allowed include marsh hydrology (drying vs. flooding), rainfall, temperature, in-star larval stages and spray history of each marsh unit.

D. How would the use be conducted?

Weekly monitoring of mosquito larvae densities on the salt marsh are currently conducted by SCVC. Surveys are conducted from May through September using a standard mosquito dipper. Seven monitoring units have been established at Wertheim and six units at the Seatuck NWR. Each unit is sampled and managed separately. Sampling consists of walking a prescribed route through each saltmarsh unit and periodically taking a dip sample (minimum of 25 samples per unit) and documenting larvae number, number of sample dips, age classes, marsh description, and GPS location. These data are compiled by SCVC and provided to the Refuge Manager. If the criteria for breeding density, marsh hydrology, weather, in-star stage, and temperature are met the Refuge Manager can approve the aerial spraying of larvicide that week for that specific unit. Each unit can be treated only once per week. Typically, 4 to 10 larvicide applications a year are made by SCVC on Refuge units.

As part of the mosquito monitoring program, the Refuge Manager permits SCVC to operate mosquito adult traps on the Refuge from May through October. These traps are used to gauge trends in adult mosquito numbers, species composition (which provides information on where they are being produced); Specimens are sent out periodically to the New York State Department of Health (DOH) where the mosquito samples are analyzed for pathogens and determining when a public health threat exists. If a public health emergency is declared within an 8 miles radius of the Refuge, the Refuge Manager may approve of aerial spraying of adulticide after consulting with the Regional Supervisor. Adulticide sprayed on the Refuge will be conducted on the upland sections of the Refuge only, not in wetlands. The Refuge Manager, after consulting with officials from SCVC and the New York State or county public health department, will have final approval for treatment areas on the Refuge.

SCVC is required to send a report on all mosquito control activities conducted on the Refuge for the year. The report consists of a list of treatment days, units treated on the Refuge, the number of acres treated, as well as the type and quantity of larvicide applied. Tables 1& 2 provides data on the number of acres treated with various larvicides, pounds of Active Ingredients, and the number treatments from 1990-2011.

E. Why is the use being proposed?

The use is being proposed to minimize health risks to humans and wildlife from mosquito borne disease. Both Wertheim and Seatuck NWR are adjacent to high density residential areas where human health/mosquito interactions are a concern. Specifically, the major known threat is West Nile Encephalitis (caused by West Nile Virus, WNV). This disease is present on Long Island and had 81 reported test-positives in 2011 in Suffolk County ([USGS 2012](#)). It is also known to cause high mortality in certain avian species which are a part of the pathogens life cycle. Other mosquito borne disease known to be present in Suffolk County, but which are much less common, are; Eastern Equine Encephalitis

(EEE), St Louis Encephalitis (SLE), LaCrosse Encephalitis (LAC), Cache Valley Virus, Malaria (Ginsberg 2005). All have the potential to be serious health concerns. Mosquito surveillance and control are a standard method of monitoring these risks and minimizing the chance of serious outbreaks.

Availability of Resources:

No additional resources will be needed to complete the project. Preparation of annual Pesticide Use Proposals, Pesticide Use Reports, and Special Use Permits; reviewing monitoring reports; and reviewing annual action-reports are functions that can be accomplished with existing Refuge funding and staffing levels.

Anticipated Impacts of the Use:

This activity has three principal potential impacts on Refuge lands, waters, or natural resources. These include disturbance to wildlife caused by the aerial application of larvicides, impacts to wildlife by the periodic elimination of mosquito larvae from the salt marsh community, and the impacts of larvicides on non-target organisms. All three potential impacts are mitigated by only allowing treatment of the marsh when the criteria for spraying, as described above, have been met and by requiring approval for treatment by the Refuge Manager. Thus instead of being treated weekly for twenty consecutive weeks like most Long Island salt marshes, the Refuge's salt marsh typically receives less than half that treatment level. Disturbance by aircraft typically lasts for twenty minutes per salt marsh unit being treated and likely produces fewer disturbances than if a ground sprayer was employed. Larvicide treatments are more target-specific and less persistent in the environment than most chemical insecticides and thus have less impact on salt marsh biota. (Fleming et al. 1985, Fortin et al. 1987, Lee and Scott 1989, Marten et al. 1993, Mittal et al. 1991, Parsons and Surgeoner 1991, Purcell 1981). The level of larvicide treatment needed at the Refuges is also reduced by managing the saltmarsh as distinct units, by weekly monitoring of larvae populations, and by only allowing treatment when mosquito breeding is documented as widespread and when marsh conditions warrant treatment.

Potential impacts from IMM source reduction projects consist of disturbance, displacement, landscape/habitat alterations, hydrologic changes, and soil compaction. Specialized, low ground pressure equipment is used during construction to mitigate factors such as vegetation trampling and soil compaction. Standard practices are used to avoid and contain discharges of pollutants into the project areas during construction. It has been shown that after initial construction disturbances that species diversity increases and many species benefit from this salt marsh restoration technique (Rochlin et al. 2012).

Public Review and Comment:

Further public comment opportunity will take place concurrently with the public review of this announcement.

Determination (Check one below):

☐ Use is not Compatible

☒ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

The following stipulations are required to ensure compatibility: 1) SCVC must apply for and receive a Special Use Permit annually from the Refuge Manager, 2) larvae control is only to be conducted when breeding is widespread as determined by Refuge staff within specific units, 3) mosquito surveillance sampling is to be conducted weekly, 4) only approved larvicides may be applied on the Refuge marshes, 5) the Refuge Manager will be contacted at least one day in advance before each application, 6) the Refuge Manager has final approval for any and all larvae treatments, 7) the Refuge Manager in consultation with SCVC and public health officials may authorize application of mosquito adulticide on the Refuges only after there is evidence of a potential health risk to the public and wildlife, and 8) a final report of all control activities conducted on the Refuges by SCVC must be provided to the Refuge Manager before the end of the year.

This Compatibility Determination may be rescinded at any time based on future Fish and Wildlife Service Policy determinations or upon review of scientific studies of the effects of larvicides on the environment or non-target organisms.

Justification:

The Wertheim NWR and Seatuck NWR were established as inviolate sanctuaries, or for any other management purpose, for migratory birds. Mosquito control activities by SCVC at the Refuges as indicated, are compatible with the purposes for which the Refuges were established. With the above stipulations in place, this use will not materially interfere with or detract from the purpose for which the Refuges were established.

Signature: Refuge Manager: _____
(Signature and Date)

Concurrence: Regional Chief: _____
(Signature and Date)

Mandatory 5-year Re-Evaluation Date: _____

Literature

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Table1: Wertheim National Wildlife Refuge acres treated with larvicides during 1990 - 2011.

Year of Treatment	Pesticide Used	Pounds of Active Ingredients	Number of Acres Treated	Number of Treatments
1990	VectoBac (CG)	30,000 lbs of AI/acre	3000 acres	12 applications
1991	VectoBac(CG)	14,900 lbs of AI/acre	2250 acres	9 applications
1992	VectoBac (CG)	6,000 lbs of AI/acre	1750 acres	7 applications
1993	VectoBac (CG)	15,000 lbs of AI/acre	1500 acres	6 applications
1994	VectoBac(CG)	31,700 lbs of AI/acre	6300 acres	14 applications
1995	Altosid	12 lbs of AI/acre	3600 acres	8 applications
	VectoBac (CG)	32,000 lbs of AI/acre	2700 acres	6 applications
1996	VectoBac (CG)	3, 600 lbs of AI/acre	520 acres	1 application
	Altosid	14.42 lbs of AI/acre	3825 acres	8.5 applications
	Scourge	600 fl. oz	1000 acres	1 application
1997	Altosid	19.56 lbs of AI	5175 acres	11 applications
1998	Altosid	11.33 lbs of AI/acre	3735 acres	9 applications
	VectoBac (CG)	101.3 lbs of AI/acre	450 acres	1 application
1999	VectoBac (AS)	17.01 billion ITU	450 acres	1 application
	Altosid	39 lbs of AI/acre	2925 acres	6.5 applications
2000	Altosid	11.46 lbs of AI/acre	3,415 acres	14 applications
2001	Altosid 20% Conc.	55 lbs of AI/acre	4,144 acres	15 applications
	VectoBac (AS)	613.7 billion ITU	1013 acres	3 applications
2002	Altosid 20% Conc.	24 lbs of AI/acre	1, 769 acres	9 applications
	VectoBac (AS)	580 billion ITU	960 acres	4 applications
2003	Altosid 20% Conc.	10 lbs of AI/acre	3,728 acres	17 applications
	VectoBac(AS)	38.82 billion ITU	642 acres	4 applications
	Scourge	1.27 lbs of AI/acre	1,010 acres	1 application
2004	Altosid 20% Conc.	2.4 lbs of AI/acre	926 acres	6 applications
	VectoBac(AS)	28.3 billion ITU	468 acres	2 applications
2005	Altosid 20% Conc.	2.8 lbs of AI/acre	1047 acres	7 applications
	VectoBac (AS)	10.68 billion ITU	1475 acres	8 applications
2006	Altosid 20% Conc.	2.8 lbs of AI/acre	1047 acres	14applications
	VectoBac (AS)	10.68 billion ITU	1475 acres	8 applications
2007	Altosid 20% Conc.	2.8 lbs of AI/acre	421 acres	14applications
	VectoBac (AS)	10.68 billion ITU	421 acres	8 applications
2008	Altosid	175,500 lbs of AI/acre	438 acres	11 applications
	VectoBac (CG)	75.2 billion ITU	438 acres	11 applications
	Scourge	6.1 lbs of AI/acre	220 acres	1 application
2009	Altosid 20% Conc.	2.2 lbs of AI/acre	425 acres	9 applications
	VectoBac (AS)	76.5 billion ITU	425 acres	11 applications
2010	Altosid	2.5 lbs of AI/acre	438 acres	9 applications
	VectoBac (CG)	67.8 billion ITU	438 acres	10 applications
	Scourge	5.8 lbs of AI/acre	220 acres	1 application
2011	Altosid 20% Conc.	2.5 lbs of AI/acre	425 acres	8 applications
	VectoBac (AS)	43.8 billion ITU	425 acres	7 applications

Note: In years 1990 – 2006, the number of acres treated was based on the acres multiplied by the number of treatment applications, while in 2007 – 2011 acres reported are the actual acres in the treatment areas.

CG – Custom Granules

AS – Aqueous Suspension

Table 2: Seatuck National Wildlife Refuge acres treated with larvicides during 1990 - 2011.

Year of Treatment	Pesticide Used	Pounds of Active Ingredients	Number of Acres Treated	Number of Treatments
1990	VectoBac (CG)	10,500 lbs of AI/acre	1190 acres	17 applications
1991	VectoBac(CG)	11,900 lbs of AI/acre	1190 acres	17 applications
1992	VectoBac (CG)	11,400 lbs of AI/acre	1190 acres	17 applications
1993	VectoBac (CG)	5,840 lbs of AI/acre	630 acres	9 applications
1994	VectoBac(CG)	7,230 lbs of AI/acre	840 acres	10 applications
1995	Altosid	3 lbs of AI/acre	910 acres	13 applications
	VectoBac (CG)	4,600 lbs of AI/acre	420 acres	6 applications
1996	VectoBac (CG)	728 lbs of AI/acre	140 acres	2 application
	Altosid	1.6 lbs of AI/acre	469 acres	6 applications
1997	Altosid	2.18 lbs of AI	651 acres	9 applications
1998	Altosid	11.33 lbs of AI/acre	3735 acres	9 applications
	VectoBac (CG)	101.3 lbs of AI/acre	450 acres	1 application
1999	Altosid	0.47 lbs of AI/acre	140 acres	2 application
2000	Altosid	2.8 lbs of AI/acre	834 acres	10 applications
	VectoBac (AS)	38.7 billion ITU	49 acres	1 application
2001	Altosid 20% Conc.	2.23 lbs of AI/acre	663 acres	12 applications
	VectoBac (AS)	139.5 billion ITU	230 acres	3 applications
2002	Altosid 20% Conc.	6.55 lbs of AI/acre	487 acres	9 applications
	VectoBac (AS)	81.55 billion ITU	135 acres	4 applications
2003	Altosid 20% Conc.	1.92 lbs of AI/acre	713 acres	4 applications
	VectoBac(AS)	6.06 billion ITU	100 acres	4 applications
2004	Altosid 20% Conc.	0.65 lbs of AI/acre	245 acres	7 applications
	VectoBac(AS)	120.0 billion ITU	130 acres	3 applications
2005	Altosid 20% Conc.	0.49 lbs of AI/acre	182 acres	4 applications
	VectoBac (AS)	1.92 billion ITU	265 acres	5 applications
2006	Altosid 20% Conc.	0.41 lbs of AI/acre	182 acres	10 applications
	VectoBac (AS)	1.92 billion ITU	265 acres	5 applications
2007	Altosid 20% Conc.	0.49 lbs of AI/acre	99 acres	10 applications
	VectoBac (AS)	1.92 billion ITU	99 acres	5 applications
2008	Altosid	3.8 lbs of AI/acre	91 acres	9 applications
	VectoBac (CG)	71,208 lbs. of AI/acre***billion ITU	54 acres	9 applications
2009	Altosid 20% Conc.	1.09 lbs. of AI/acre	82 acres	8 applications
	VectoBac (AS)	24.9 billion ITU (how did we get this #? (85,151.99 lbs. of AI/acre)	82 acres	12 applications
2010	Altosid	0.8 lbs of AI/acre	82 acres	6 applications
	VectoBac (CG)	24.9 billion ITU	82 acres	9 applications
2011	Altosid 20% Conc.	0.6 lbs of AI/acre	82 acres	11 applications

	VectoBac (AS)	8.1 billion ITU	82 acres	4 applications
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*** = data incomplete

Note: In years 1990 – 2006, the number of acres treated was based on the acres multiplied by the number of treatment applications, while in 2007 – 2011 acres reported are the actual acres in the treatment areas.

CG – Custom Granules

AS – Aqueous Suspension